



**Washington State
Department of Transportation**

Memorandum

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Subject: Final Weigh/Inspection Station Site Feasibility Study Memorandum
Project Name: I-90 / SR 18 Interchange and Weigh/Inspection Station Design Services Project
Attention: Santa Tekleyes, Project Manager, WSDOT
From: Susan Bartlett, Jacobs
Date: December 20, 2018
Copies to: Tom La Bolle, Mark Allison, John Chi, WSDOT

1. Introduction

This Memorandum is to document the study of the feasibility of various sites for the relocation of the existing I-90/SR 18 Weigh/Inspection Station and recommend sites for further advancement in the selection process through Practical Solutions Approach to select a Preferred Alternative.

A new Weigh/Inspection Station is a result of both the need to have a functional Weigh/Inspection Station along I-90 in the eastbound direction per the *Commercial Vehicle Enforcement System Strategic Plan, August 2017* and the removal of the existing facility at the interchange of I-90 and SR 18 to allow for interchange improvements. The I-90/SR 18 Interchange and Weigh/Inspection Station Improvement Project (Project) will finance the new Weigh/Inspection Station from within its total project budget of \$150,000,000.

This study reflects criteria and preference input from the following:

- Port of Entry requirements
- Previous work performed by Washington State Department of Transportation (WSDOT)
- Criteria developed from the workshop held August 1, 2018 with Washington State Patrol (WSP). The preferences were documented in meeting minutes: *2018-08-01 I-90/SR 18 WSP Mtg Minutes.doc*.
- Existing conditions
- In-state and national examples of existing Weigh/Inspection Stations

This Memorandum included a review of the five sites from the previous WSDOT study, *I-90/SR 18 Interchange Weigh Station Site Investigation, July 2017* as well as a sixth site that was outside of the study area of the previous report.

Weigh/Inspection Station general site design criteria and screening criteria are defined in Sections 2 and 5, respectively. All sites reviewed were required to meet these general criteria. Screening criteria have been developed that will allow for review and differentiation of sites with favorable functional and operational conditions, minimized environmental impact, and costs within the project budget.

The six sites were qualitatively evaluated in the study through screening criteria developed from the sources noted above.

2. Site Design Criteria

Site design criteria are based on the WSDOT study, *I-90/SR 18 Interchange Weigh Station Site Investigation, July 2017* and were revised and supplemented based on input from WSP and other stakeholders and the *2018 Baseline and Contextual Needs Statement Memorandum*. The criteria in the “Need” column, of Table 2-1 are considered required. The design criteria table also notes Wants and Desires from WSP and the stakeholders. This input allows the project to accommodate additional non-required criteria where possible and provide differentiating factors for screening.

Table 2-1. Design Criteria

Criteria	Need	Want	Desire
1. New facility located on eastbound I-90 east of SR 18 in order to serve as a Port of Entry inspection facility and to enforce freight traffic weight regulations to protect roads and bridges from excessive wear and tear caused by overweight freight.	x		
2. New facility located west of MP 38 to reduce additional operational costs associated with freezing temperatures.		x	
3. Site does not have bypass routes that could be used to avoid the facility.		x	
4. Impacts to existing facilities, such as chain up areas, can be offset within the new facility. If the location of the new station displaces chain up areas, an equivalent area must be accommodated within the station.	x		
5. E-screening, Weigh in Motion, and other Innovative Technology Deployment can be installed to suppliers' recommendations.	x		
6. Off/On ramp designed to CD standards [Collector Distributor Roads, WSDOT Design Manual 1360].	x		
7. WSP Scale House visibility of 180-degrees on eastbound I-90 for enforcement purposes.	x		
8. WSP Scale House visibility of vehicles from scale house to parking and to on-ramp for enforcement purposes.	x		
9. Holding cell in scale house, 10-foot by 10-foot, access to outside, for driver assessment.		x	
10. Providing electric outlets for parked trucks/vehicles to reduce potential truck idling.			x
11. Restroom Facilities on site for drivers	x		
12. Design Vehicle	WB-67	House Hauler	

Table 2-1. Design Criteria

Criteria	Need	Want	Desire
13. Queue storage length	3 WB-67 trucks long x 2 lanes minimum	6 WB-67 trucks long x 2 lanes	Maximize
14. Lighting levels on site	Standard lighting levels around scale house		
15. Scale House Private Office	1-minimum		
16. Site - Private Offices	5 additional either in scale house or inspection building		
17. Site – Desk	Administrative assistant, either in scale house or inspection building		
18. Site – Staff desks		Between 10-30	
19. Site – Assembly area		Sized for 40 staff	
20. Parking –trucks	15 spaces		Maximized for additional layover
21. Parking – WSP Vehicles		25-30 spaces	
22. Upstream E-screening location	Minimum 1 mile		

3. Process for Site Selection

Initially, potential sites were identified based on availability of constructible area along eastbound I-90, then reviewed for ability to meet functional needs, right of way and environmental considerations. Once sites appeared to be viable, they were included in this study for screening analysis. This process is noted below.

Five sites were identified in WSDOT's *I-90/SR 18 Interchange Weigh Station Site Investigation, July 2017*. Additional sites were located based on WSDOT's constraint of being located between the existing interchange with SR 18 at MP 25, and MP 38. WSDOT later modified the constraint for site locations to include a site at MP 41.5. The sites noted in WSDOT's previous study were verified and the corridor was examined for additional potential sites within the identified constraints.

Potential sites that would impact residential property were not pursued.

The Weigh/Inspection Station will be designed to fulfill functional and operational needs of WSP, as recorded in *2018-08-01 I-90/SR 18 WSP Mtg Minutes.doc*. See Appendix 5. Two key activities on the site are the weighing of vehicles and physical inspection of vehicles. The site configuration is required to

accommodate these activities. As such, the study was conducted reviewing potential sites with both considerations.

The activity of weighing of vehicles requires the vehicles to move across the scales adjacent to the scale house and allow a potential for vehicles to be re-weighed using one of three configurations:

- A) Circular: Providing an on-site return to the scale,
- B) Linear, 3rd Scale: adding an additional scale past the parking area, or
- C) Linear, off site return: having vehicles exit the station and return to the station via I-90 and local streets.

As such, the study was conducted reviewing potential sites with a minimum one of these configurations, as the sites allow.

See Appendix 1 for site locations. Examples of existing in-state Weigh/Inspection Stations are found in Appendix 2. Appendix 3 is included for reference to illustrate additional configurations of existing national Weigh/Inspection Stations.

Initial estimated costs for potential sites were based on WSDOT's *I-90/SR 18 Interchange Weigh Station Site Investigation, July 2017*. An estimate for Option 6 was developed by WSDOT using the same methodology in November 2018. Cost estimates were revised based on surfacing material and depth, revising Hot-Mix Asphalt (HMA) to Portland Concrete Cement (PCC) with the depths based on WSDOT designs for the Weigh/Inspection Station plans for I-90 in Spokane. Cost estimates are included in Appendix 4.

Resources

Additional resources used in reviewing the corridor for potential sites include the following:

- Lidar-based digital terrain models (DTMs) for the stretch of I-90 from MP 28.4 to MP 43.0 to determine elevations
- Right-of-way property lines provided by WSDOT
- Aerial imagery provided by WSDOT
- King County iMap on the King County website used for geographic information of the surrounding areas near I-90

4. Potential Sites for Screening

The initial review confirmed the five sites previously proposed in the WSDOT study and the sixth site identified in this study were acceptable potential sites. These sites are identified as Options 1 through Options 6, with preliminary layouts located in Appendix 1. Options may show configuration variations in the figures.

Option 1

This option would place the Weigh/Inspection Station at a wide spot in the highway right of way along eastbound I-90 that was originally planned for a rest area. The Station would begin just east of the Winery Road off-ramp. There is currently no eastbound I-90 on-ramp at this interchange, so significant traffic conflicts would not be expected.

The topography at this site generally slopes uphill to the south of I-90 within the limits of the site. Eastbound I-90 has an approximate 2% downgrade in the vicinity. Four streams cross I-90 via culvert at this site. The streams flow from south to north. There is a history of debris and sediment from the streams causing obstruction in culverts and ditches. Two of the culverts are listed on the Fish Passage Inventory as Repair Required: a 580-foot, 2.5-foot diameter concrete culvert crosses both directions of I-90 at a depth of approximately 25 feet and a 132-foot, 2-foot diameter corrugated steel culvert crosses westbound I-90 at a depth of approximately 10 feet. Addressing the fish barriers typically requires replacement of the culverts. Addressing weigh station impacts could require realignment of the streams. King County 1990 Sensitive Area Ordinance identifies the area as Erosion Hazard Area. Due to the width of the weigh station facility, deep cuts would be required in the hillside. Retaining walls up to 50 feet tall will have to be constructed in order to keep impacts within the existing state right of way. A linear layout was investigated as part of this study and was determined not to offer significant cost savings.

Revised Option 1 costs were estimated to be \$86,300,000. The top cost items are the retaining wall, roadway excavation including haul and culvert replacement. See Appendix 4.

Option 2

This option would place the Weigh/Inspection Station on a relatively level area along eastbound I-90 north of the Snoqualmie River. The facility would begin within the 436th Avenue SE interchange (I/C). The weigh in motion (WIM) sensor would be located on mainline eastbound I-90 east of the on-ramp from 436th Avenue SE. Vehicles leaving the weigh station would exit to the eastbound I-90 off-ramp to 468th Avenue SE. A second lane would be added to the ramp to provide space for weaving traffic. Vehicles would use the eastbound I-90 on-ramp to return to I-90. A signalized intersection may be needed to regulate traffic flow through the interchange. With this configuration, there is room on this site for chain up area to replace the area along the mainline removed for station installation.

The topography of this site is generally level for 100 ft to 300 ft south of I-90. Beyond that, the ground drops rapidly 30 ft – 40 ft down to the Snoqualmie River Valley. Eastbound I-90 has an approximate 2% upgrade in this vicinity. North Bend Way between the 436th Avenue SE Interchange and 468th Avenue SE Interchange could be used as a bypass route around a weigh station at this site.

The off-ramp to the weigh station would fall within a 3,800 foot long chain up area. This chain up area would need to be closed to avoid sight distance and weaving issues. WSP has indicated that trucks will be able to use the weigh station to chain up. This chain up area is primarily used by trucks. There are additional chain up areas farther east that cars tend to use. The off-ramp to the weigh station at this site would be within the wellhead protection zone for the well which supplies water to Camp Waskowitz, a year-round education camp run by the Highline School District. The site of the weigh station was occupied by a truck stop prior to the construction of I-90. A site survey would be needed to determine if there are any remaining hazardous materials on the site.

Revised Option 2 costs were estimated to be \$23,900,000. The estimate for Option 2 includes 35 parking spaces to accommodate chain up area removed along I-90. The top cost items are the cement concrete pavement and roadway excavation including haul. See Appendix 4.

Option 3

This option would place the Weigh/Inspection Station along eastbound I-90 next to Olallie State Park. The facility would begin in the vicinity of the 468th Avenue SE Interchange on-ramp.

The topography of the western two-thirds of this site rises up to 25 ft above I-90 for 100 feet to 300 feet south of I-90 before sloping down over 200 ft to the Snoqualmie River valley. The eastern third of this site slopes rapidly down over 200 ft to the Snoqualmie River valley. Eastbound I-90 has an approximate 5.5% upgrade in this vicinity. Twin Falls State Park is adjacent to the south side of I-5 at this location. Most of the material from the western two-thirds of this site would need to be removed to provide a level area in the weigh station footprint. Retaining walls up to 180 feet tall would be required around the entirety of the

scale and storage area. Right of way will be needed from Twin Falls State Park. A new single lane bridge will need to be constructed over the Snoqualmie River for the weigh station on-ramp to eastbound I-90. King County 1990 Sensitive Area Ordinance identifies the area as Erosion Hazard Area. A linear layout shifted to the west was investigated as part of this study but was found not to significantly reduce cost or park land impacts.

Revised Option 3 costs were estimated be \$108,600,000. The top cost items are the roadside restoration and retaining wall and gravel borrow. See Appendix 4.

Option 4

This option would place the Weigh/Inspection Station along eastbound I-90 next to Olallie State Park. The facility would begin in the area of the West Homestead Valley Road Interchange. The East and West Homestead Valley Road Interchanges are half interchanges. The eastbound I-90 off-ramp is at the West Homestead Valley Road Interchange. The eastbound I-90 on-ramp is at the East Homestead Valley Road Interchange.

The topography of most of this site rises up from 40 feet to over 100 ft above I-90 for 300 feet to 800 feet south of I-90 before sloping down 100 ft to the Snoqualmie River valley. Eastbound I-90 has an approximate 3% upgrade in this vicinity. Olallie State Park is adjacent to the south side of I-90 at this location. Two streams cross I-90 via culvert on this site. Both culverts are listed on the Fish Passage Inventory as Repair Required: a 566-foot, 84-inch diameter steel structural plate pipe crosses both direction of I-90 at a depth of approximately 100 feet and a 566-foot, 60-inch diameter steel structural plate pipe crosses both directions of I-90 at a depth of approximately 80 feet. Addressing fish barriers typically requires replacement of the culverts. Homestead Valley Road between the East and West Homestead Valley Rd I/Cs provide a straightforward bypass route around the weigh station. Google Maps shows numerous trucks parking along the road. Retaining wall up to 125 feet tall will be needed to minimize impacts to the state park. However, right of way will still be required from Olallie State Park.

Revised Option 4 costs were estimated to be \$117,800,000. The top cost items are the fish passage contingency and retaining walls. See Appendix 4.

Option 5

This option would place the weigh station between the existing weigh station along eastbound I-90 west of Cle Elum and Bullfrog Road I/C. The electronic screening would begin approximately 400 feet east of the Golf Course Road I/C on-ramp. Vehicles leaving the weigh station would exit to the eastbound I-90 off-ramp to Bullfrog Road. Vehicles would use the eastbound I-90 on-ramp to return to I-90. A signalized intersection may be needed to regulate traffic flow through the interchange.

The topography of this site is generally flat between I-90 and the railroad tracks. Eastbound I-90 has a flat grade in the vicinity of this site. The Yakima River is at least 1,500 feet south of the project site. There are no known sensitive areas within the site and no known stream crossings.

Revised Option 5 costs were estimated to be \$26,400,000. The top cost items are the cement concrete pavement and the roadside restoration. See Appendix 4.

Option 6

This option would place the Weigh/Inspection Station along eastbound I-90 between the East Homestead Valley Road I/C and the Tinkham Road I/C. Vehicles leaving the Weigh/inspection Station would exit to the eastbound I-90 off-ramp to Tinkham Road. Vehicles would use the eastbound I-90 on-ramp to return to I-90. A signalized intersection may be needed to regulate traffic flow through the interchange. With this configuration, there is room on this site for up to 20 truck parking stalls within the weigh station footprint.

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The topography of this site south of I-90 generally slopes downhill to the south fork of the Snoqualmie River south of I-90. The river is approximately 20 feet below I-90 and 700 feet to 400 feet to the south, though the distance narrows to less than 100 feet at the off-ramp. Eastbound I-90 has an approximate 1% upgrade in this vicinity. There is a series of forest service roads that could be used as a bypass route, however they would be very challenging for freight traffic to use and are obstructed in the winter. There are steep slopes north of I-90 and south of the Snoqualmie River which may be susceptible to landslides, the river bank on the south side of the interchange is steep and may be susceptible to erosion. Because of the close proximity of the Snoqualmie River, a shoreline substantial development permit would be required. There are four known stream crossings that would be impacted by the Weigh/Inspection Station that are either unrated or rated as non-fish bearing. Portions of these streams may require realignment. There is also a known culvert approximately 400 feet in length that is listed as a fish barrier that would be crossed but not impacted by the ramp widening for the Weigh/Inspection Station exit. There are known high quality wetlands between I-90 and the Snoqualmie River that the Weigh/Inspection Station. The Weigh/inspection Station would likely have impacts to the buffer and may have direct impacts to the wetlands themselves.

Evaluation of this site is ongoing and there are several outstanding issues:

- Presence of fish in impacted streams
- Determine if any fish passage barriers would need to be addressed in this project
- Location of wetlands and extent of impacts needs to be evaluated
- The site may require minor acquisition of right of way

Revised Option 6 costs were estimated to be \$29,900,000. The top cost items are the cement concrete pavement and retaining wall. See Appendix 4.

Table 4-1. Site Screening Analysis

Options		Operational Characteristics					F. ROW Impacts
		A. Cost	B. Potential Bypass Route	C. Re-Weigh Opportunity on-Site	D. Staffing Availability	E. Truck Parking	
Option 1	Between Winery Rd and N Bend Boulevard	\$86.3M	Yes	Yes Circular	Yes	Yes	Minimal property takes
Option 2	Between 436th Ave SE and 468th Ave SE	\$23.9M	Yes	Yes Linear	Yes	Yes	
Option 3	Between 468th Ave SE and Homestead Valley Rd	\$108.6M	No	Yes Circular	Yes	Yes	Impact on Twin Falls State park
Option 4	Between Homestead Valley Rd Interchanges	\$117.8M	Yes	Yes Circular	Yes	Yes	Impact on Ollalie State park
Option 5	West of Bullfrog Road	\$26.4M	No	Yes Circular	No	Yes	ROW acquisition required.
Option 6	West of Tinkham Road	\$29.9M	Yes	Yes Linear	Yes	Yes	

Shaded cells indicate favorable characteristics.

5. Screening Criteria

For the evaluation of the Weigh/Inspection Station sites, six differentiating screening criteria were identified. Each screening criteria is briefly described below. They are grouped for organizational purposes. Cost is weighted as the highest priority and the remaining five criteria are equally weighted in this screening evaluation. Cost is prioritized due to the fact that the proposed Weigh/Inspection Station will be funded as noted below, and it is required that the cost be within the allocated budget. Other criteria are differentiating criteria that were refined from the wants and desires criteria. These criteria are not required, but if they can be accommodated, they are considered favorable.

The results of the screening review are noted in Table 4-1, Site Screening Analysis above. Green shaded cells in the screening table indicate favorable characteristics. Favorable characteristics include meeting design criteria wants and desires, have relative reduced cost, relative better staffing opportunities, or relatively less impact on right of way.

The following criteria were evaluated and determined not to be differentiating criteria:

- Environmental Impacts: The major environmental impacts, for example, correcting fish passage barriers, are included in the cost of the site.
- Existing Road Geometry: None of the locations evaluated that met the cost criteria have significant adverse roadway geometry.
- Existing Utilities: Only major utilities, for example electrical transmission towers, would have a significant impact on site evaluation. There is no indication of such facilities at the locations evaluated.
- Geotechnical Issues: None of the locations that met the cost criteria were found to have known critical geotechnical issues.

Operational Characteristics

A. Cost

As stated above, the Project will finance the new Weigh/Inspection Station from within its total project budget of \$150,000,000. As such, costs for each Weigh/Inspection Station site was weighted highest in the screening process. Based on the portion of the project funding dedicated to the Weigh/Inspection Station, alternatives that had costs above \$35,000,000 were eliminated from further consideration. The primary items that were evaluated by the estimate include earthwork, retaining walls, paving and surfacing, site clearing and restoration/mitigation, known fish passage corrections, E-screening, and site facilities including buildings, scales, illumination, and signals.

B. Potential Bypass Route

Enforcement by WSP occurs as trucks pass by the Weigh/Inspection Station. In order to reduce opportunity for vehicles to evade the station and enforcement, drivers may look for routes not along I-90 and thus, bypass the station along local roads, such as frontage or side roads.

The selected Weigh/Inspection Station location should be located so that trucks cannot use frontage or side roads to bypass the station. A single bypass route may be acceptable but would require equipment to be installed along the route to serve a similar function as the Weigh-in-Motion (WIM) equipment on I-90. Electronic equipment used in scanning vehicles is referred to as E-screening.

Avoiding a location between two interchanges that features a side road connecting both interchanges is preferred to avoid such bypass. Option 2 provides an example of a bypass, where SE North Bend Way connecting the interchanges at 436th Avenue SE and 468th Avenue SE would allow trucks to bypass a Weigh/Inspection Station placed between these two interchanges.

C. Return Opportunity

Linear and Circular configurations were identified as potential site layouts. The Linear configuration reflects a layout of the station that once vehicles pass by the scale house, they would have an option to exit the station or proceed to an inspection site. This layout allows a minimized width and is preferable for certain site locations. In cases where vehicle needs to return to the scale house, the Linear configuration would either have a third scale past the parking area for re-weighing of vehicles, or, require the vehicle to exit the station to the interstate, use two interchanges to proceed westbound and then return eastbound to re-enter the station.

The Circular configuration layout entails accommodating two WB-67 180 degree turns, so that vehicles can loop around on site to access an inspection location and allow the vehicle to access the scales without exiting the station. The on-site return requires a wider footprint.

In a second meeting with WSP on November 28th, 2018, WSP indicated that the Linear, 3rd scale configuration was the preferred configuration, but that the Circular configuration was acceptable.

D. Staffing Availability

The Weigh/Inspection Station location can affect the ease of staffing. By placing the Weigh/Inspection Station west of Snoqualmie Pass rather than east, there is a higher population from which to draw potential staff. WSP has stated that the existing westbound I-90 Weigh/Inspection Station at Cle Elum currently has difficulty in attracting and maintaining staff for the facility despite aggressive recruiting and salary incentives. Aggressive recruiting by WSP has included among other methods advertising on social media and salary incentives. Consequently, WSP is unable to operate the current facility full time and anticipate they would have the same difficulty with a new facility in the same area.

E. Truck Parking

All sites must accommodate the minimum parking required to serve trucks during and after inspection. Trucks may be required to be held until they can pass inspection and are not allowed to re-enter I-90.

This criterion is to screen sites for potential additional site parking that may be desired to accommodate vehicles unable to proceed easterly on I-90 due to Snoqualmie Pass weather related closures or due to required breaks. Parking beyond the minimum parking spaces for the station is not a requirement but was considered as a benefit in the site selection.

F. ROW Impacts

The selected Weigh/Inspection Station should minimize right-of-way impact. Purchasing additional right-of-way is acceptable. However, right-of-way impacts to parks is not preferred. Impacts that require the displacement of residential property will also not be considered for the new Weigh/Inspection Station location.

6. Conclusions

Six potential Weigh/Inspection Station sites were reviewed against the 6 screening criteria.

Alternatives with costs higher than \$35,000,000 were not within the proposed project budget and were screened out.

The conclusion is that Options 2, 5 and 6 should be further evaluated through the Practical Solutions Approach based on their potential for successful implementation of the design criteria. Option 6 has

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outstanding issues that must be resolved prior to inclusion in the evaluation process. Options 1, 3, and 4 were screened out due to costs that would result in exceeding the project budget.

Appendix 1

I-90 EB POE Weigh Station Exhibits WSDOT, July 2017

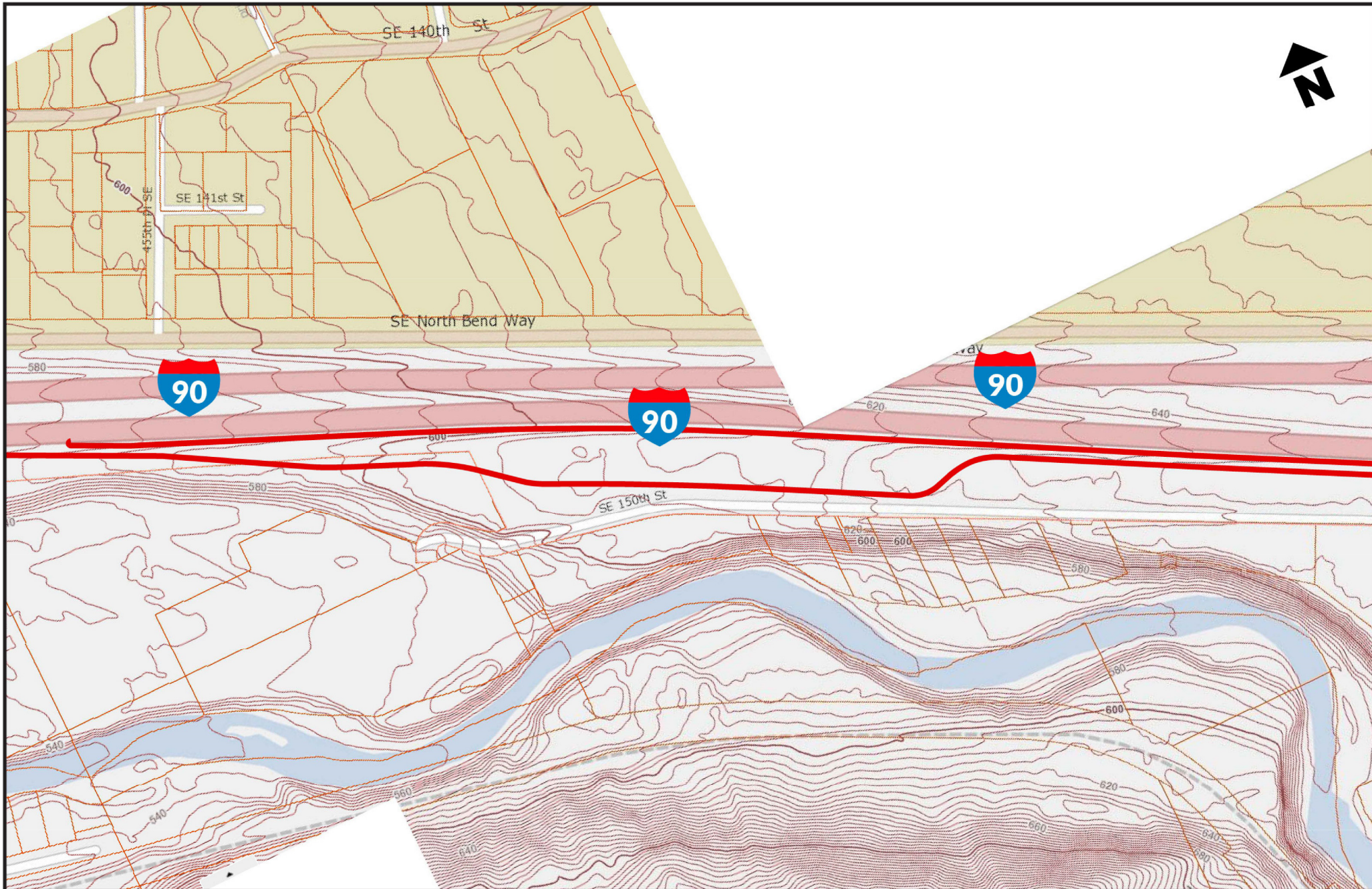
I-90 Eastbound Weigh Stations

Vicinity Map



I-90 Eastbound Weigh Station

Option 2: Narrow Layout



I-90 Eastbound Weigh Station

Option 2: 35 truck parking stalls



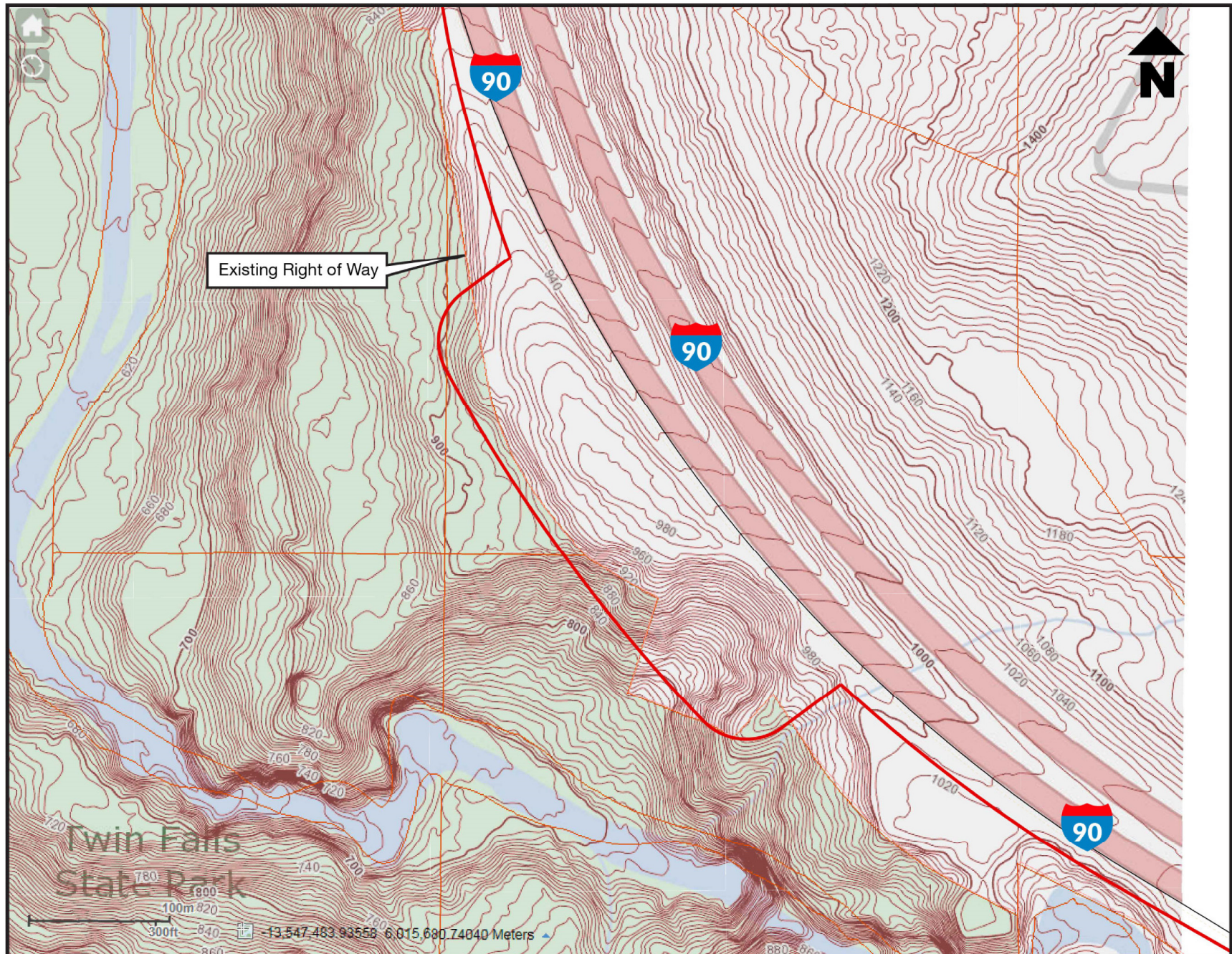
I-90 Eastbound Weigh Station

Option 2: 70 truck parking stalls



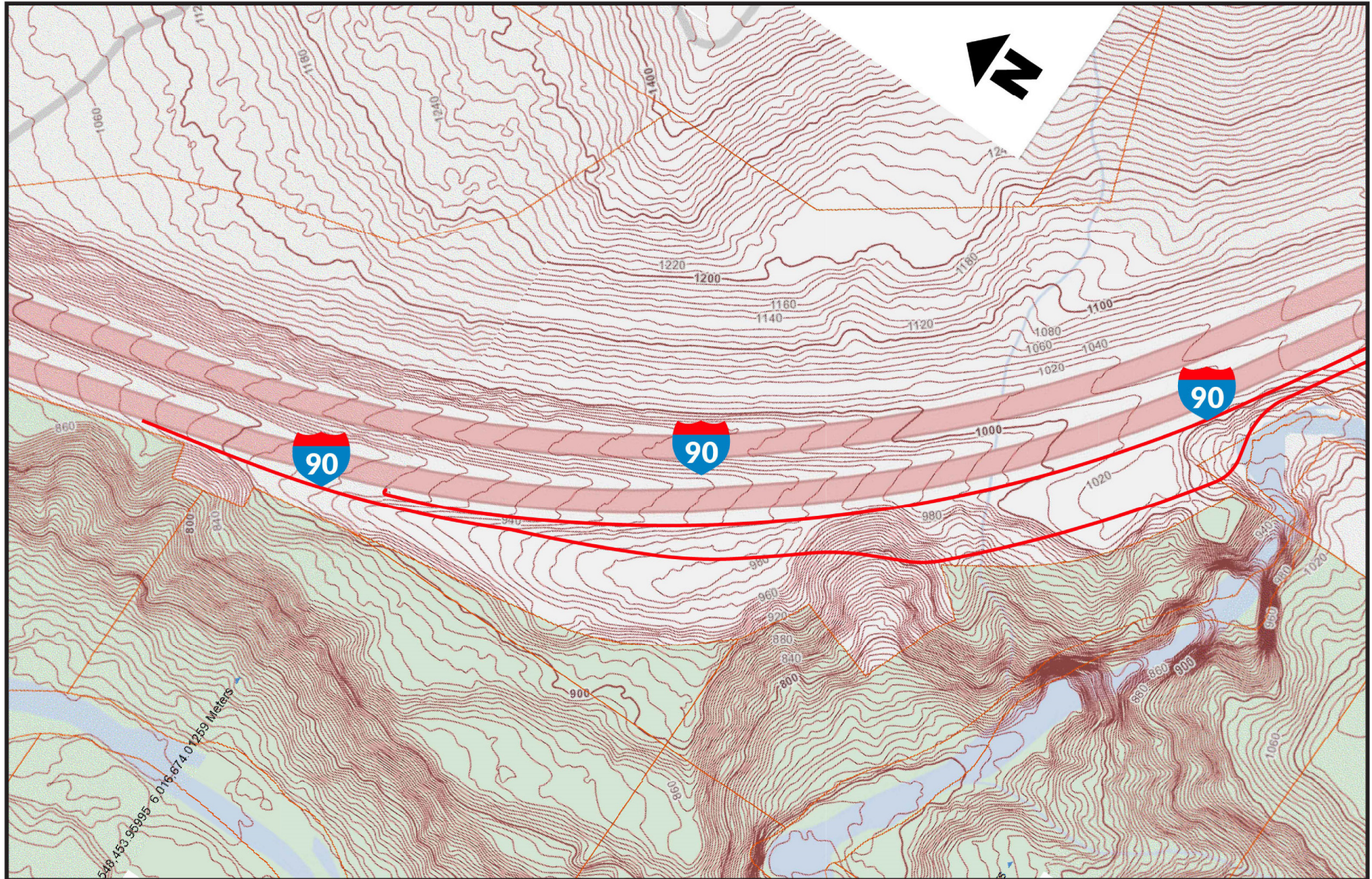
I-90 Eastbound Weigh Station

Option 3: Wide Layout



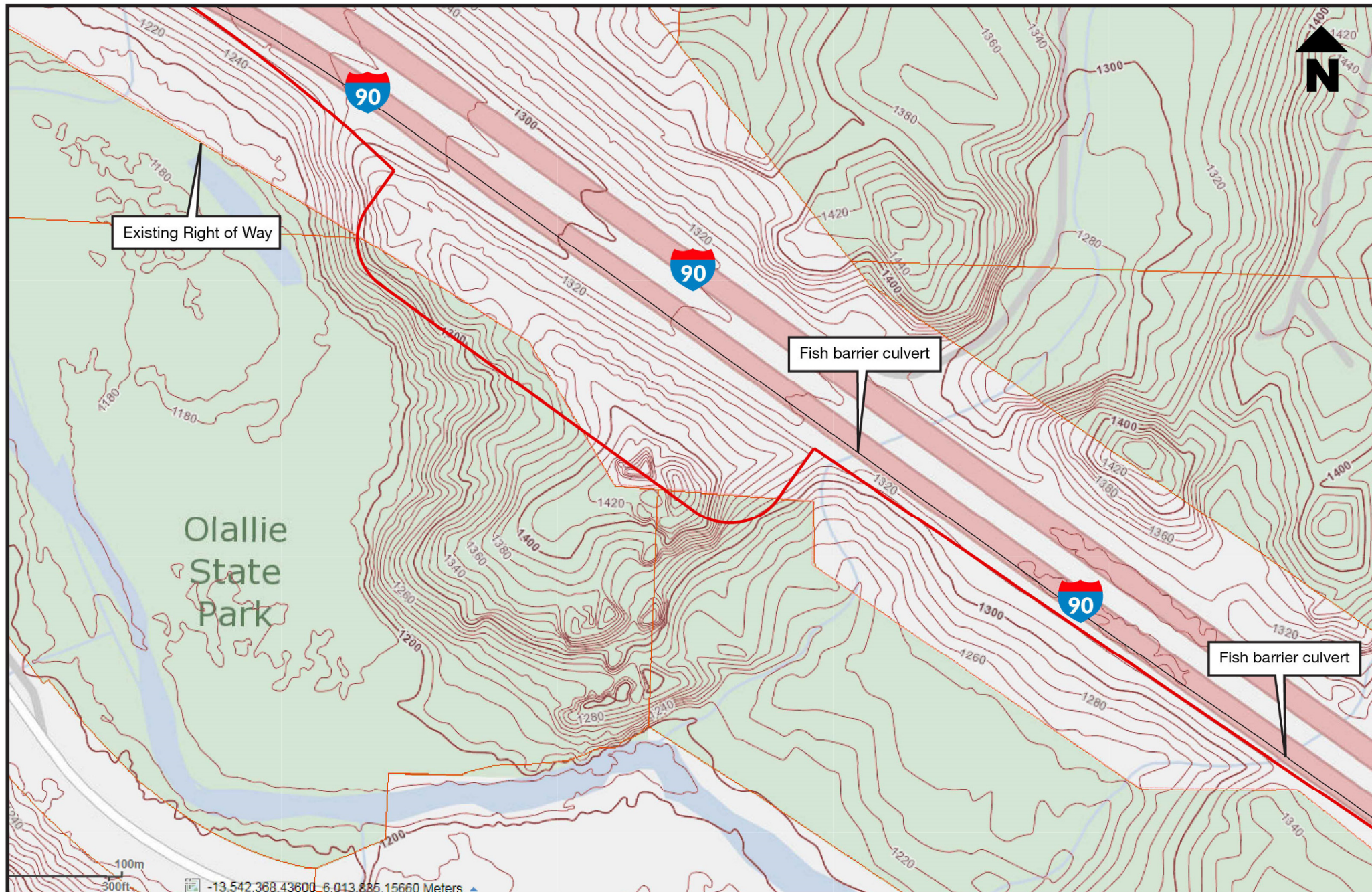
I-90 Eastbound Weigh Station

Option 3: Narrow Layout



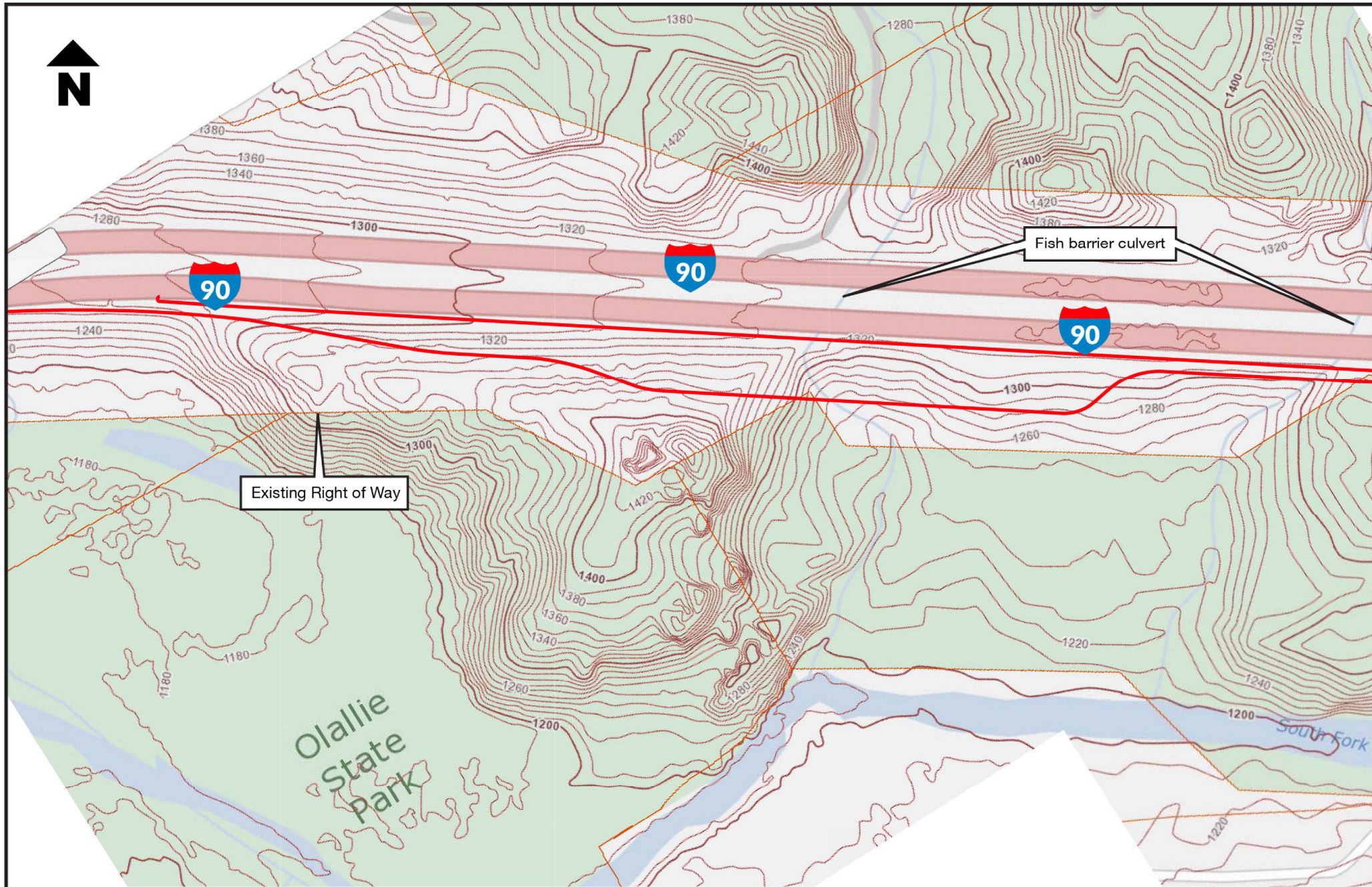
I-90 Eastbound Weigh Station

Option 4: Wide Layout



I-90 Eastbound Weigh Station

Option 4: Narrow Layout



I-90 Eastbound Weigh Station

Option 5: Wide Layout



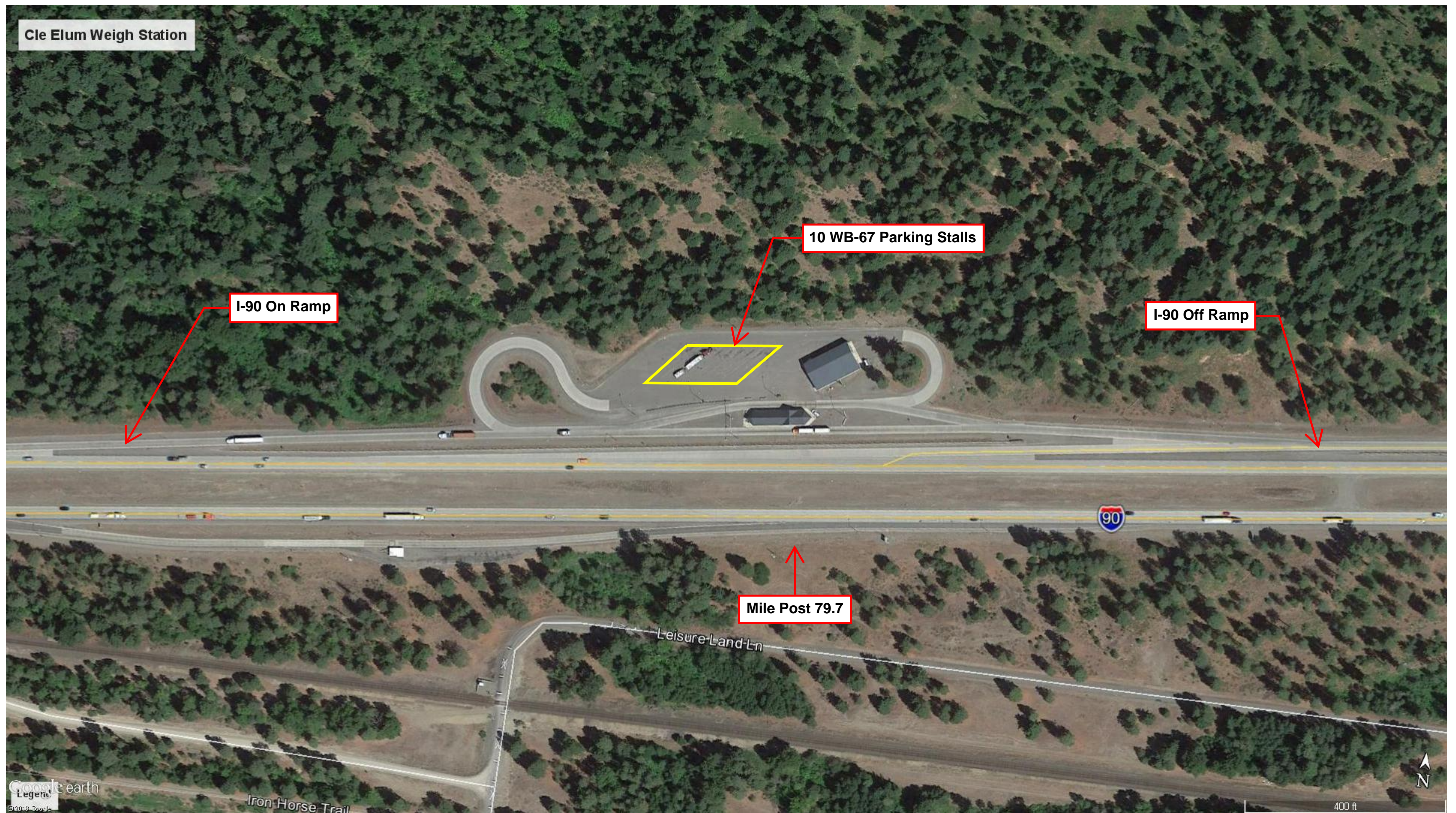
I-90 Eastbound Weigh Station

Option 6 Tinkham Road



Appendix 2

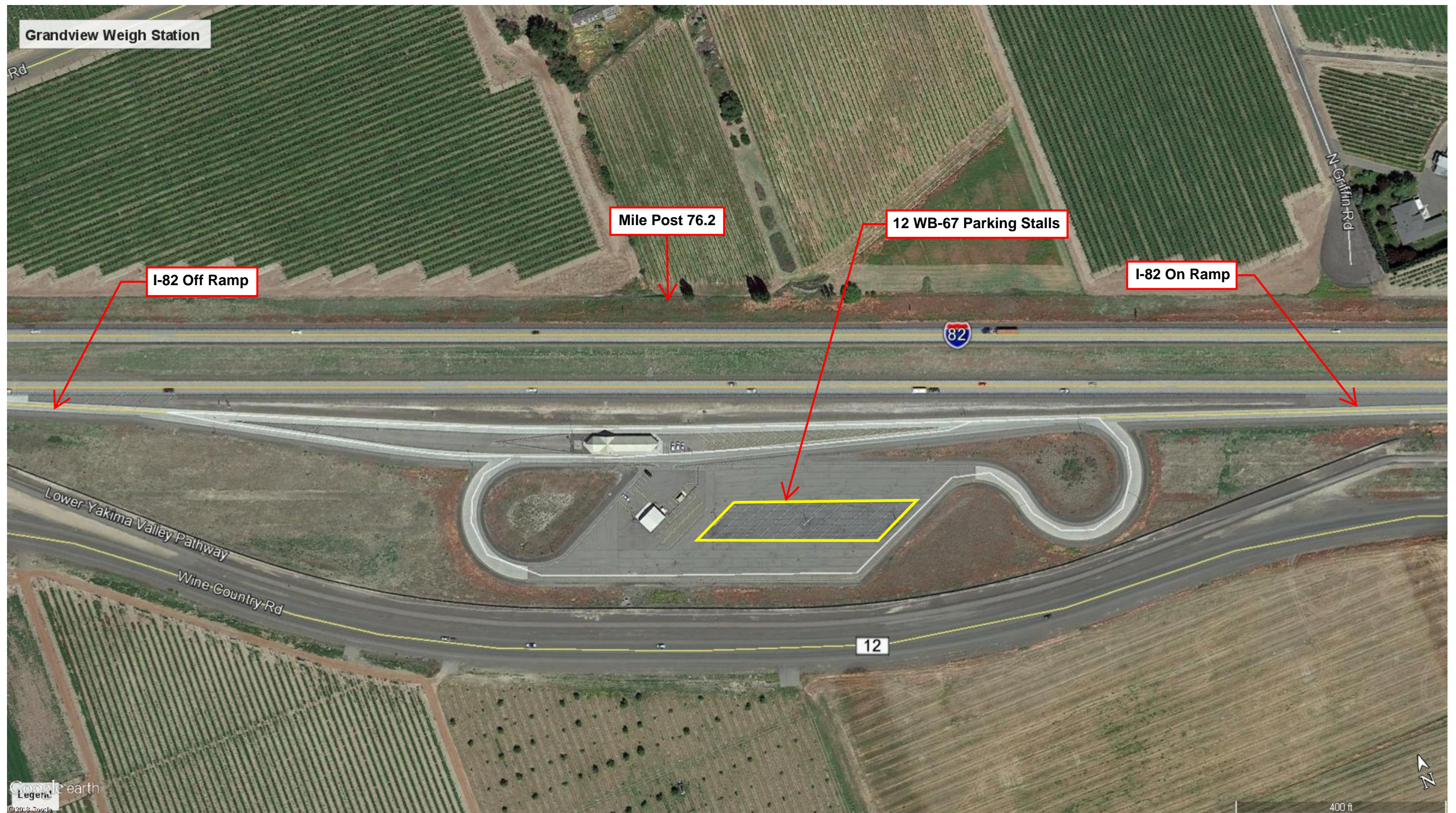
Existing Washington Weigh Station Exhibits



I-90 / SR 18 Weigh Investigation Station Feasibility Study
Existing Washington Weigh Station Exhibit 1
I-90 near Cle Elum, WA



I-90 / SR 18 Weigh Investigation Station Feasibility Study
Existing Washington Weigh Station Exhibit 2
I-90 near Spokane Valley, WA



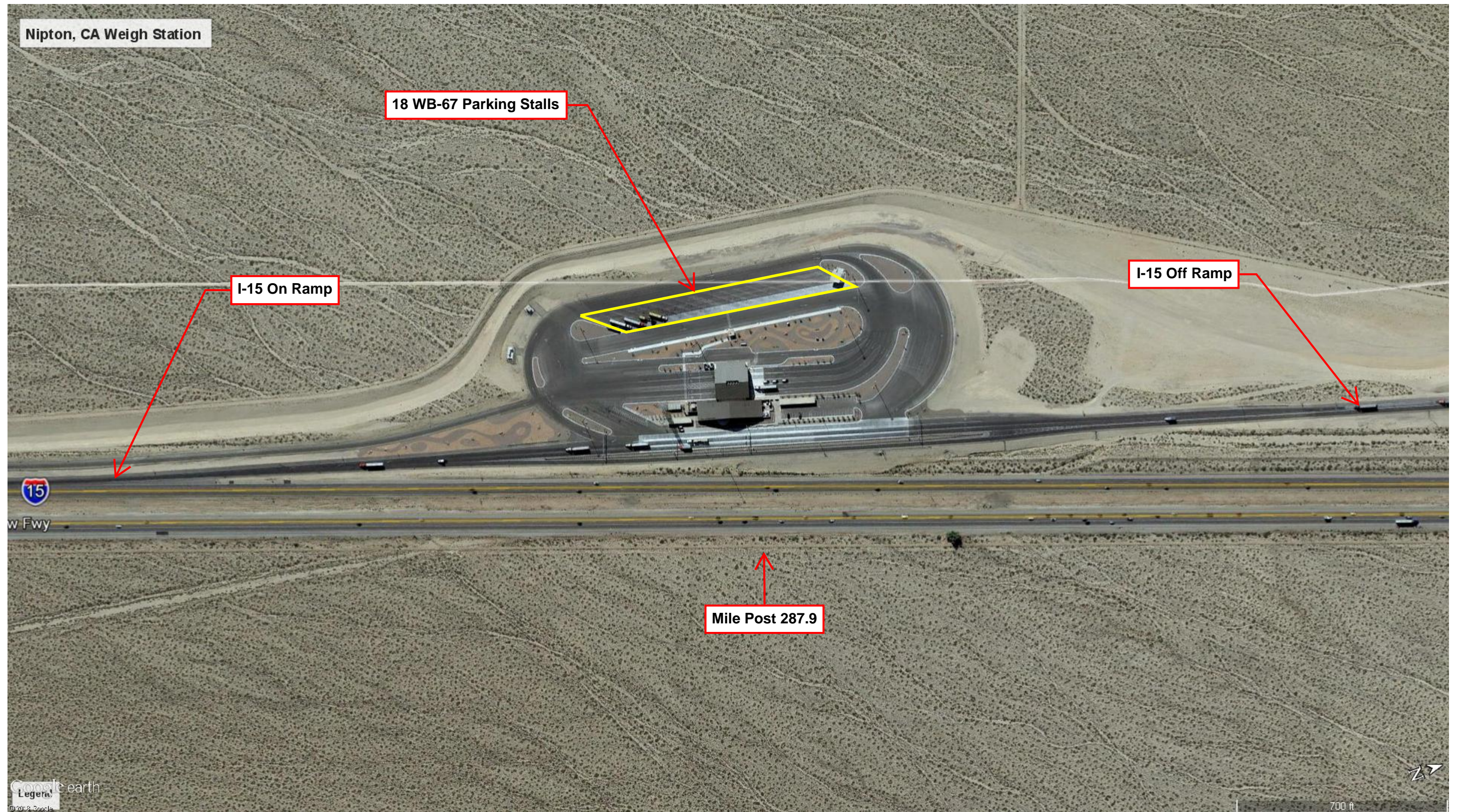
I-90 / SR 18 Weigh Investigation Station Feasibility Study
 Existing Washington Weigh Station Exhibit 3
 I-82 near Grandview, WA

Appendix 3

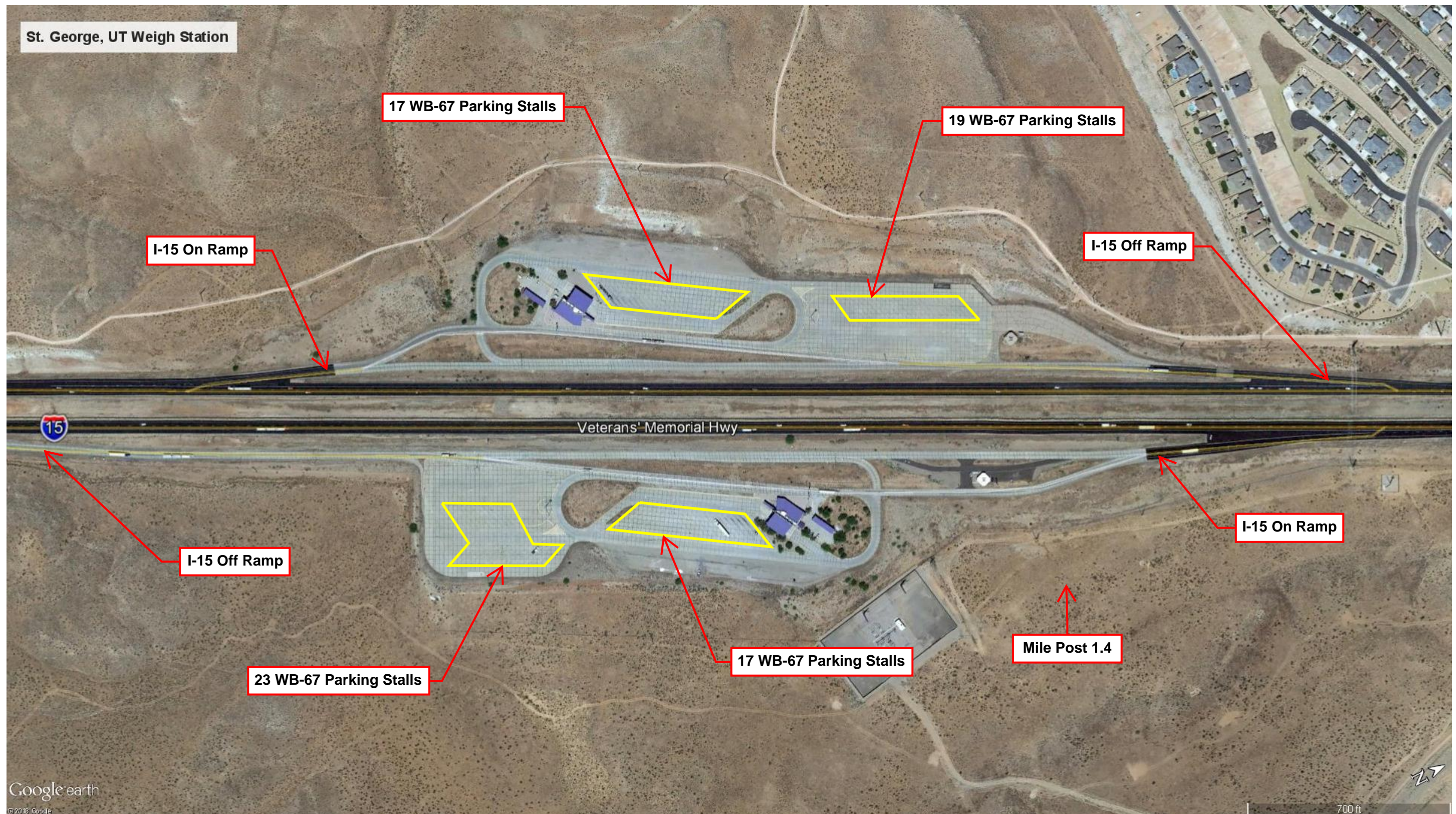
Existing National Weigh Station Exhibits



I-90 / SR 18 Weigh Investigation Station Feasibility Study
Existing Nation Weigh Station Exhibit 1
I-35 near Devine, TX



I-90 / SR 18 Weigh Investigation Station Feasibility Study
Existing Nation Weigh Station Exhibit 2
I-15 near Nipton, CA



I-90 / SR 18 Weigh Investigation Station Feasibility Study
Existing Nation Weigh Station Exhibit 3
I-15 near St. George, UT

Appendix 4

Revised Cost Estimates

Option 1: Station Located 1 mile east of Exit 27 Port of Entry Size

Std Item No	Item	Unit	Unit Cost	Total	Total Cost
0025	Clearing and Grubbing	Acre	\$15,000	15.1	\$226,067.0
0310	Roadway Excavation Incl. Haul	CY	\$15	327,002	\$4,905,036.7
0470	Embankment Compaction	CY	\$4	30,211	\$120,844.4
5100	Crushed Surfacing Base Course	Ton	\$30	19,236	\$577,080.0
5625	Cement Conc. Pavement	CY	\$340	10,566	\$3,592,440.0
5767	HMA Cl. 1/2 IN. PG	Ton	\$85		\$0.0
	Roadside Restoration	LS	\$1	1,352,000	\$1,352,000.0
	Retaining Wall	SF	\$170	56,300	\$9,571,000.0
	Reinforced Slope	SF	\$20	54,250	\$1,085,000.0
	Electrical, Illumination & ITS	LS	\$200,000	1	\$200,000.0
	CVISN Facility	Each	\$1,000,000	1	\$1,000,000.0
	Truck Weigh Scale	Each	\$100,000	2	\$200,000.0
	Culvert Replacement	LS	\$1	0	\$4,762,800.0
				Subtotal	\$27,592,268
Miscellaneous	100%				\$27,592,268
				Subtotal	\$55,184,536
Mobilization	10%				\$5,518,454
				Subtotal	\$60,702,990
Sales Tax	9.5%				\$5,766,784
				Subtotal	\$66,469,774
Construction Engineering	14%				\$9,305,768
Contingency	4%				\$2,658,791
Construction Total					\$78,435,000
Preliminary Engineering					\$7,844,000
Right of Way					\$0
					\$86,279,000

Option 2: Station Located between 436th St and 468th St interchanges exit to off-ramp. 35 parking spots expandable

Std Item No	Item	Unit	Unit Cost	Total	Total Cost
0025	Clearing and Grubbing	Acre	\$15,000	5.5	\$81,915
0120	Removing Asphalt Concrete Pavement	SY	\$8	6,484	\$51,869
0310	Roadway Excavation Incl. Haul	CY	\$15	76,899	\$1,153,489
5100	Crushed Surfacing Base Course	Ton	\$30	15,926	\$477,785
5625	Cement Conc. Pavement	CY	\$340	8,803	\$2,992,986
5767	HMA Cl. 1/2 IN. PG	Ton	\$85		\$0
	Roadside Restoration	LS	\$750,000	1	\$750,000
	Electrical, Illumination & ITS	LS	\$450,000	1	\$450,000
	CVISN Facility	Each	\$1,000,000	1	\$1,000,000
	Truck Weigh Scale	Each	\$100,000	2	\$200,000
				Subtotal	\$7,158,044
Miscellaneous		100%			\$7,158,044
				Subtotal	\$14,316,089
Mobilization		10%			\$1,431,609
Hazardous Material Risk					\$500,000
Traffic Operations Mitigation Risk					\$500,000
				Subtotal	\$16,747,698
Sales Tax		9.5%			\$1,591,031
				Subtotal	\$18,338,729
Construction Engineering		14%			\$2,567,422
Contingency		4%			\$733,549
Construction Total					\$21,640,000
Preliminary Engineering		10%			\$2,164,000
Right of Way					\$50,000
					\$23,854,000

Option 3: Station Located 1 mile east of the 468th St interchange Port of Entry size
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Std Item No	Item	Unit	Unit Cost	Total	Total Cost
0025	Clearing and Grubbing	Acre	\$15,000	13.4	\$201,636
0310	Roadway Excavation Incl. Haul	CY	\$15	118,552	\$1,778,283
0431	Gravel Barrow Incl. Haul	Ton	\$7	735,667	\$5,149,670
0470	Embankment Compaction	CY	\$2	486,572	\$973,144
5100	Crushed Surfacing Base Course	Ton	\$30	18,937	\$568,110
5625	Cement Conc. Pavement	CY	\$340	10,403	\$3,537,020
5767	HMA Cl. 1/2 IN. PG	Ton	\$85		\$0
	Roadside Restoration	LS	\$1	10,538,000	\$10,538,000
	Retaining Wall	SF	\$80	113,981	\$9,118,480
	Bridge	SF	\$300	4,800	\$1,440,000
	Electrical, Illumination & ITS	LS	\$200,000	1	\$200,000
	CVISN Facility	Each	\$1,000,000	1	\$1,000,000
	Truck Weigh Scale	Each	\$100,000	2	\$200,000
					\$34,704,343
Miscellaneous		100%			\$34,704,343
					\$69,408,686
Mobilization		10%			\$6,940,869
					\$76,349,554
Sales Tax		9.5%			\$7,253,208
					\$83,602,762
Construction Engineering		14%			\$11,704,387
Contingency		4%			\$3,344,110
Construction Total					\$98,652,000
Preliminary Engineering		10%			\$9,866,000
Right of Way					\$0
					\$108,518,000

Option 4: Station Located between Homestead Valley Rd interchanges exit to I-90. 35 parking spots expandable to 56

Std Item No	Item	Unit	Unit Cost	Total	Total Cost
0025	Clearing and Grubbing	Acre	\$15,000	5.6	\$83,667
0310	Roadway Excavation Incl. Haul	CY	\$15	122,049	\$1,830,739
0431	Gravel Barrow Incl. Haul	Ton	\$7	143,254	\$1,002,781
0470	Embankment Compaction	CY	\$2	168,972	\$337,944
5100	Crushed Surfacing Base Course	Ton	\$30	19,237	\$577,110
5625	Cement Conc. Pavement	CY	\$340	10,567	\$3,592,780
5767	HMA Cl. 1/2 IN. PG	Ton	\$85		\$0
	Roadside Restoration	LS	\$730,000	1	\$730,000
	Retaining Wall - Fill	SF	\$80	64,451	\$5,156,091
	Retaining Wall - Cut	SF	\$170	63,108	\$10,728,405
	Electrical, Illumination & ITS	LS	\$200,000	1	\$200,000
	CVISN Facility	Each	\$1,000,000	1	\$1,000,000
	Truck Weigh Scale	Each	\$100,000	2	\$200,000
	Fish Passage Risk	LS	\$12,225,600	1	\$12,225,600
				Subtotal	\$37,665,118
Miscellaneous		100%			\$37,665,118
				Subtotal	\$75,330,236
Mobilization		10%			\$7,533,024
				Subtotal	\$82,863,260
Sales Tax		9.5%			\$7,872,010
				Subtotal	\$90,735,270
Construction Engineering		14%			\$12,702,938
Contingency		4%			\$3,629,411
Construction Total					\$107,068,000
Preliminary Engineering		10%			\$10,707,000
Right of Way					\$0
					\$117,775,000

Option 5: Station Located on EB I-90 in Cle Elum (Improvement Exist Weigh Station Site) Port of Entry Size
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Std Item No	Item	Unit	Unit Cost	Total	Total Cost
0025	Clearing and Grubbing	Acre	\$16,000	13.2	\$211,566.3
0421	Gravel Barrow Incl. Haul	CY	\$16	51,776	\$828,422.8
0470	Embankment Compaction	CY	\$4	51,776	\$207,105.7
5100	Crushed Surfacing Base Course	Ton	\$30	17,442	\$523,257.0
5625	Cement Conc. Pavement	CY	\$340	9,703	\$3,299,020.0
5767	HMA Cl. 1/2 IN. PG	Ton	\$85		\$0.0
	Roadside Restoration	LS	\$1	1,859,000	\$1,859,000.0
	Electrical, Illumination & ITS	LS	\$200,000	1	\$200,000.0
	CVISN Facility	Each	\$1,000,000	1	\$1,000,000
	Truck Weigh Scale	Each	\$100,000	2	\$200,000.0
				Subtotal	\$8,328,372
Miscellaneous	100%				\$8,328,372
				Subtotal	\$16,656,744
Mobilization	10%				\$1,665,674
				Subtotal	\$18,322,418
Sales Tax	8.0%				\$1,465,793
				Subtotal	\$19,788,212
Construction Engineering	14%				\$2,770,350
Contingency	4%				\$791,528
Construction Total					\$23,351,000
Preliminary Engineering					\$2,336,000
Right of Way					\$685,000
					\$26,372,000

Option 6: Station Located immediately west of Exit 42 Linear Configuration

Std Item No	Item	Unit	Unit Cost	Total	Total Cost
0025	Clearing and Grubbing	Acre	\$15,000	6.7	\$99,990.9
0310	Roadway Excavation Incl. Haul	CY	\$70	710	\$49,693.7
0431	Gravel Barrow Incl. Haul	Ton	\$7	223,161	\$1,562,126.8
0470	Embankment Compaction	CY	\$4	120,628	\$482,510.2
5100	Crushed Surfacing Base Course	Ton	\$30	14,953	\$448,590.0
5625	Cement Conc. Pavement	CY	\$340	8,554	\$2,908,360.0
5767	HMA Cl. 1/2 IN. PG	Ton	\$85		\$0.0
	Roadside Restoration	LS	\$1	280,000	\$280,000.0
	Retaining Wall	SF	\$40	51,290	\$2,051,588.3
	Electrical, Illumination & ITS	LS	\$200,000	1	\$450,000.0
	CVISN Facility	Each	\$1,000,000	1	\$1,000,000.0
	Truck Weigh Scale	Each	\$100,000	2	\$200,000.0
				Subtotal	\$9,532,860
Miscellaneous	100%				\$9,532,860
				Subtotal	\$19,065,720
Mobilization	10%				\$1,906,572
				Subtotal	\$20,972,292
Sales Tax	9.5%				\$1,992,368
				Subtotal	\$22,964,660
Construction Engineering	14%				\$3,215,052
Contingency	4%				\$918,586
Construction Total					\$27,099,000
Preliminary Engineering					\$2,710,000
Right of Way					\$0
					\$29,809,000

Appendix 5

**Meeting minutes WSP and WSDOT
2018-08-01 I-90/SR 18 WSP Mtg Minutes.doc
August 2017**

MEETING SUMMARY

Washington State Patrol Meeting August 1, 2018		Y-1214, I-90/SR 18 INTERCHANGE
ATTENDEES:	Mark Allison/WSDOT Santa Tekleyes/WSDOT John Chi/WSDOT Tom La Bolle/WSDOT Jason Beloso/WSDOT	Maan Sidhu/WSDOT Matt Couchman/WSP Tom Foster/WSP Kevin Nichols /Jacobs Susan Bartlett /Jacobs Asvin Mandadi /Jacobs
COPY TO:		
PREPARED BY:	Susan Bartlett	
DATE:	08/01/2018	
PROJECT:	I-90/SR 18 Interchange and Weigh Station Improvements/706739	

Objectives

Discuss the following in regard to the Weigh/Inspection Station and the Washington State Patrol

1. Needs, Wants and Desires for the New Weigh/Inspection Station
2. Design Criteria
3. Parking Requirements
4. Systems, Equipment and Software

Discussion Summary

Review of Original Site Feasibility Study

Tom provided history on WSDOT's development of the Weigh/Inspection Station Feasibility Study. WSDOT's previous criteria was reiterated.

- 1) Minimize Impacts to residential and commercial structures,
- 2) Avoid impact to the river,
- 3) Minimized earthwork, also referred to as cut/full, and
- 4) Stay within ROW,
- 5) Minimize costs.

Other considerations from the previous study:

FHWA does not support using frontage roads for station access.

WSDOT based the station size for the feasibility report initially based on the existing Cle Elum station, and revised it in consultation with WSP on needs from the Spokane station.

Each site from the WSDOT Feasibility Study was discussed.

Option 1: Challenges include large volume of cut and fill to grade the site.

Option 2: Challenges include 1) truck acceleration upgrade along existing off-ramp, weaving with existing off-ramp vehicles along the upgrade, 2) enforcement of inspection on by-pass opportunity for trucks on local roads, 3) proximity to North Bend if truck layover parking is included in station design and layout

Option 3: Challenges include 1) environmental impacts, 2) bypass opportunity for trucks on local roads

Option 4: Challenges include 1) large volume of cut and fill to grade the site, 2) environmental impacts, including river proximity and park, 3) enforcement of inspection on bypass opportunity for trucks on local roads

Option 5: Challenges include 1) Access to station would require frontage road, which is not preferred by FHWA, 2) staffing availability for station by WSP

Discussion of previous and new Design Criteria

a. Feasibility Study Criteria (Page 7)

Reviewed the previous criteria.

Minimize or avoid large volume of cut/fill to grade site.

Minimize or avoid impacts to environmentally sensitive areas and parks.

b. Design Manual Chapter 1720

Tom noted many of the criteria presented in WSDOT's Design Manual is not applicable to the I-90/SR 18 project's facility criteria, including the building criteria, circulation criteria, and Port of Entry (POE) criteria. It is mainly applicable to freeway interface.

Tom noted to design the weight/inspection station freeway interface on and off ramps with Collector Distributer criteria, with the added deceleration tables for trucks he will provide.

c. Entrance/Exit Ramps

See discussion for b above.

d. I-90 Pavement Condition

Discussed pavement conditions effect on Weigh-in-Motion(WIM) electronic pre-screening. WSP uses WIM as preliminary screen, and enforced weight is examined officially at the station. Pavement criteria was a non-issue.

e. "What does it take to park a WB-67?"

The station design for large vehicle parking will be based on a WB-67. The parking required for inspection, enforcement and any additional layover parking, if accommodated, will be initially designed using AutoTurn software, with follow-up field demonstrations for proofing. Jason can assist in the live demonstration coordination.

f. Visibility and Officer Safety

WSP's noted preference to have 180-degree view of I-90 adjacent to the station. WSP's requirement is to be able to view trucks once they pass through the station 'downstream'.

WSP also stated preference to not have a holding cell. However, in the case where a holding cell is incorporated in the station design, it should 1) have a minimum dimension of 10 feet by 10 feet, and 2) have access to the outside of the site.

g. Electrification and Other Amenities

Electricity availability: Electrification should not be included in the design. However, the potential for electrification should remain an option if the stakeholders agree it should be included. When trucks are able to plug into layover outlets, emissions are reduced. This is a desire category. Challenges are 1) the perceived increase of noise by nearby communities and 2) potential overcrowding by creating a desired location for trucks with the availability of electrification, and 3) cost of the supplied electricity.

Need to investigate the noise, and emissions impacts.

Consider adding signs in the layover parking lot saying "No Idling".

Restroom facilities: WSP requires restroom facilities be included in the station design that are available for public use outside the station facility but within the site.

h. Other Criteria

Design Vehicle: WB-67s is the standard on I-90, however there are many vehicles that are larger, and the station needs to accommodate these. Examples of larger vehicles include House Haulers, wind turbine blade haulers. Final design vehicle needs to be established and confirmed with both WSDOT and WSP.

Queuing on On-ramp: Vehicles travel approximately 3 miles per hour over the scales at the station. The total off-ramp length design is required to accommodate the truck deceleration distance, the queue distance and the approach to the scales. The queue length is not defined. WSP notes a minimum of three WB-67s, but a preferred six WB-67's in each of two lanes. Additional length is allowed if the site can accommodate it.

Lighting Levels: Area in proximity to the station should have standard lighting. Parking area is not required to have lighting.

Layover/Chain-up Area: Station sites may accommodate a paved area for truck parking for purposes beyond the Weigh/Inspection Station needs for enforcement. These needs include vehicle chain-up area, enforcement of chain-up and layover for staging and rest purposes.

i. Other

Add the following as screening parameters:

- Queue lengths
- Grades
- By-pass opportunity
- Right of Way impact
- Schedule

Staffing

a. Weigh Station

See comment above under Feasibility Study Review. WSP is concerned about the low availability of local staff for a station east of Snoqualmie Pass in Cle Elum. Option 5 is the only option in this location, which makes it less desirable.

b. Inspection Building

The station site should accommodate the following either in scale building or barn:

- Six (6) private offices, required, two of the six are required to be in the scale house
- Administrative Assistant desk, required
- Desk space for staff, non-concurrent, 16 WSP enforcement and 14 WSP commercial
- Assemble space for 40 staff for use by detachment office

Parking

a. Weigh/Inspection Needs

Site design parking requirements and considerations are as follows:

Trucks and other large vehicles may be required to park for inspection and for impoundment prior to resolving inspection issues. Minimum truck parking on site is not a defined number, but estimated to be 25 spaces, based on existing facilities.

Parking for vehicles smaller than trucks, for example the WSP vehicles, is to be provided. Minimum number of stalls is not defined but preferred to be 25 to 30 stalls.

Layover truck parking – the design of the site should consider additional truck parking for layover parking. Jason's Law should be considered when developing options for layover parking.

Station needs to support truck turning movements. Review can be performed in the preliminary phase using AutoTurn software, but a live demonstration of the layout is preferable. Jason can assist in the live demonstration coordination. See discussion above, Design Criteria e, for additional discussion.

Advance notification of available parking would be preferable/desired.

Systems, Equipment and Software

a. Mainline

Per WSP, WSP Commercial division and WSDOT are the primary contacts for electrical system equipment. Outside suppliers will be contracted through WSP/WSDOT. Outside vendors should not have influence on the design. John and/or WSP will provide contact for a follow up meeting for details on systems.

E-screening should be a minimum of one (1) mile upstream of the weigh/inspection station.

b. Bypass Sites

By-pass routes on local roads around potential weigh/inspection station options should be reviewed and considered during screening. For options with by-pass routes the requirement is to add e-screening on the bypass route. Approximate costs of the equipment along the by-pass range from \$300,000 for full design/construction of power, fiber, multiple lanes of cameras to \$68,000 for the electronic system only.

WSP noted they would be able to provide funding for the e-screening, rather than the local agency or WSDOT.

Summary Table

Criteria	Need	Want	Desire
Off/On ramp designed to CD standards	x		
WSP Scale House visibility of 180-degrees on EB I-90	x		
WSP Scale House visibility of vehicles from scale house to parking and to on-ramp	x		
Holding cell in scale house, 10'x10', access to outside		x	
Providing outlets to parked trucks/vehicles			x
Restroom Facilities on site for drivers	x		
Design Vehicle	WB-67	House Hauler	
Queue storage length	3 long x 2 lanes minimum	6 long x 2 lanes	Maximize per optional site
Lighting levels on site	Standard lighting levels around scale house		
Scale House Private Office	2-minimum		
Site - Private Offices	5 additional either in scale house or barn		
Site – Desk	Administrative assistant, either in scale house or barn		
Site – Staff desks		Between 10-30	
Site – Assembly area		Sized for 40 staff	
Parking - trucks	25 spaces		Maximized for additional layover and chain up
Parking – WSP Vehicles		25-30 spaces	
Upstream E-screening location	Minimum 1 mile		

